

**MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND**

1981 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 5

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF

- S J Lockwood
- J H Nichols
- T Williams
- W L Huggins
- D R Eaton
- W A Dawson

- H Edge (Plymouth)
- S H Coombs (IMER)
- J Aiken (IMER)
- E Barnwall (Ireland)

DURATION

6-26 May

All times are Greenwich Mean Time

LOCALITY

Celtic Sea and Lyme Bay

AIMS

1. To collect plankton samples in the Celtic Sea with a 20" unencased TTN.
2. To collect plankton samples in the Celtic Sea with the IMER Undulating Oceanographic Recorder (UOR).
3. To trawl for mackerel, scad and blue whiting in the Celtic Sea.
4. To catch post larval mackerel with a neuston net.
5. To trawl for spawning sprats in Lyme Bay, fertilise eggs and rear to hatching.

NARRATIVE

CIROLANA left Grimsby on the evening tide of 6 May and went straight to the Celtic Sea via the English Channel. During the 7 May, after passing the Isle of Wight, the UOR was deployed for the first of a series of test tows to assess the effect of various cable fairings, and to measure cable strain. This work continued on 8 May, interspersed with TTN calibrations, while steaming northwesterly across the Celtic Sea towards the start of the TTN grid off southern Ireland (Figure 1).

The first TTN grid commenced on 9 May, was halted for 10 hours by gales on 10 May, but was completed on 14 May at a position west of Ushant without further delays. While working this grid the trial tows with the UOR were continued and some demersal trawl hauls were made.

The UOR grid began west of Ushant 14 May but was halted by gale force winds later the same day. Sampling resumed 1830 h 15 May but due to technical problems with the UOR the intention to work a complete grid was abandoned. CIROLANA steamed to the Great Sole Bank with the intention of fishing throughout 16 May but after only half an hour of the second tow the ship had to dodge in severe gales until 1600 h 17 May. By this time the UOR was ready for further trials and three successful tows were made on passage to the start of the second TTN grid, which commenced on 18 May. On 19 May the TTN grid was halted to work a UOR transect across the Great Sole Bank.

This transect was reworked with the TTN before proceeding 1° further south to work a second UOR transect, followed by the final two lines of TTN stations. The final TTN haul was completed south-west of Ushant at 1600 h 23 May. CIROLANA then set course for Grimsby where she docked at 0900 h 26 May.

RESULTS

1. The Celtic Sea section of the Western mackerel plankton grid was covered twice during the cruise (Figure 1). Thirty eight samples were taken in double oblique hauls to 120 m on the first grid and 29 samples on the second grid. As in previous years the spawning was concentrated along the edge of the shelf with the highest production rates near the Great Sole Bank (Figure 2).

Salinity samples were collected and temperature profiles were recorded at each station (Figure 3). There was no sign of a thermocline in the Celtic Sea, but there was a $1\frac{1}{2}^{\circ}$ thermocline at the southeastern extremity of the surveyed area. This thermocline extended northwards across the entrance to the English Channel in the vicinity of the 100 m isobath.

2. Preliminary tuning trials with the UOR investigated the use of faired cable. These trials were inconclusive due to various rigging and handling problems. Following test tows to set up the instrumentation the UOR was towed over 523 miles, comprising 22 discrete plankton samples taken on individual tows. The typical undulation depth, without a faired cable, was 7-67 m with a wave length of 1.7 km. Valid towing was achieved over 75% of the sampled track, yielding 19 plankton samples considered to be representative of the sampled rectangles. Preliminary analysis of the sampling indicate a similar egg distribution to that found with the TTN sampling.

Environmental data were collected on all UOR tows with over 90% reliability. Parameters measured were: radiant energy (blue and green radiation), chlorophyll and temperature. All were recorded with respect to depth at 15 second intervals. (The salinity probe was removed as its external mounting induced an unacceptable undulation pattern).

3. A total of 10 trawl hauls were made with the Portuguese high headline trawl. Catches were never large, 5-20 baskets an hour. The dominant species were scod and blue whiting, but some mackerel and hake were taken in every haul. One tow made on the Great Sole Bank included a basket of blue whiting ranging 10-13 cm total length. These were aged on board ship and found to be 1-group (1980 year class). Mackerel, scod and blue whiting were measured at each station, and otoliths were taken to construct an ALK.
4. The Lowestoft neuston net was used on four occasions. At each station the dominant species was *Onca* sp., 25-50 mm long. The sample taken west of Ushant also included some pollack 30-40 mm long. Only one late stage mackerel larva was caught.

5. Due to Mr Nichols success at rearing sprat eggs on an earlier cruise (CORELLA /81) this aim was cancelled before sailing.
6. Four hauls were made with the Longhurst-Hardy plankton recorder (LHPR). These hauls were made, to a maximum depth of 210 m, to determine the vertical distribution of mackerel eggs. Preliminary examination of the samples indicates extremely high numbers of eggs taken, with a depth resolution of better than 10 m.
7. Measurements of the specific gravity of wild mackerel eggs were made in a density gradient column, they were found to be close to neutral buoyancy in local sea water. Their rate of rise was less than 10 cm per hour. As in previous investigations artificially fertilised mackerel eggs were found to be more positively buoyant than wild eggs, and were found to increase in buoyancy during development.

Stephen J Lockwood
8 June 1981

SEEN IN DRAFT: Captain T H Finn
W J Saxby - Fishing Skipper

INITIALLED: DJG

DISTRIBUTION:

Basic List
S J Lockwood (10)
J H Nichols
T Williams
W L Huggins
D R Eaton
W A Dawson
H Edge (Plymouth)
S H Coombs (IMER)
J Aiken (IMER)
E Barnwall (Ireland)

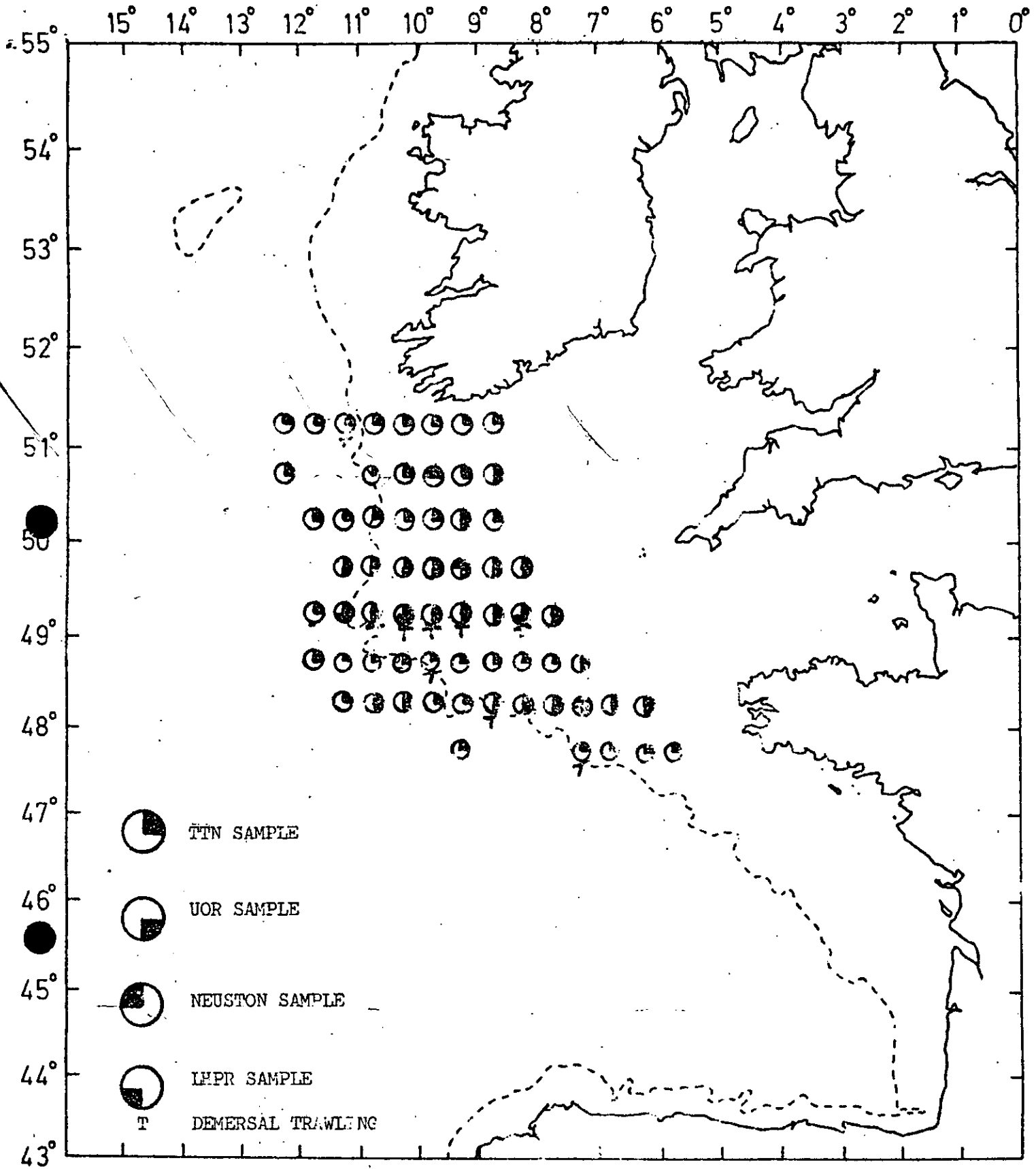


FIGURE 1

The plankton grid sampled during CIPOLANA Cruise 5/81. The first TTN grid worked alternate rows from the most northerly row to the row west of Ushant (48°15' N). The second TTN grid commenced at the second most northerly row and worked southwards to 47°45' N. UOR transects were worked across the Great Sole Bank at 49°30' N and 50°00' N.

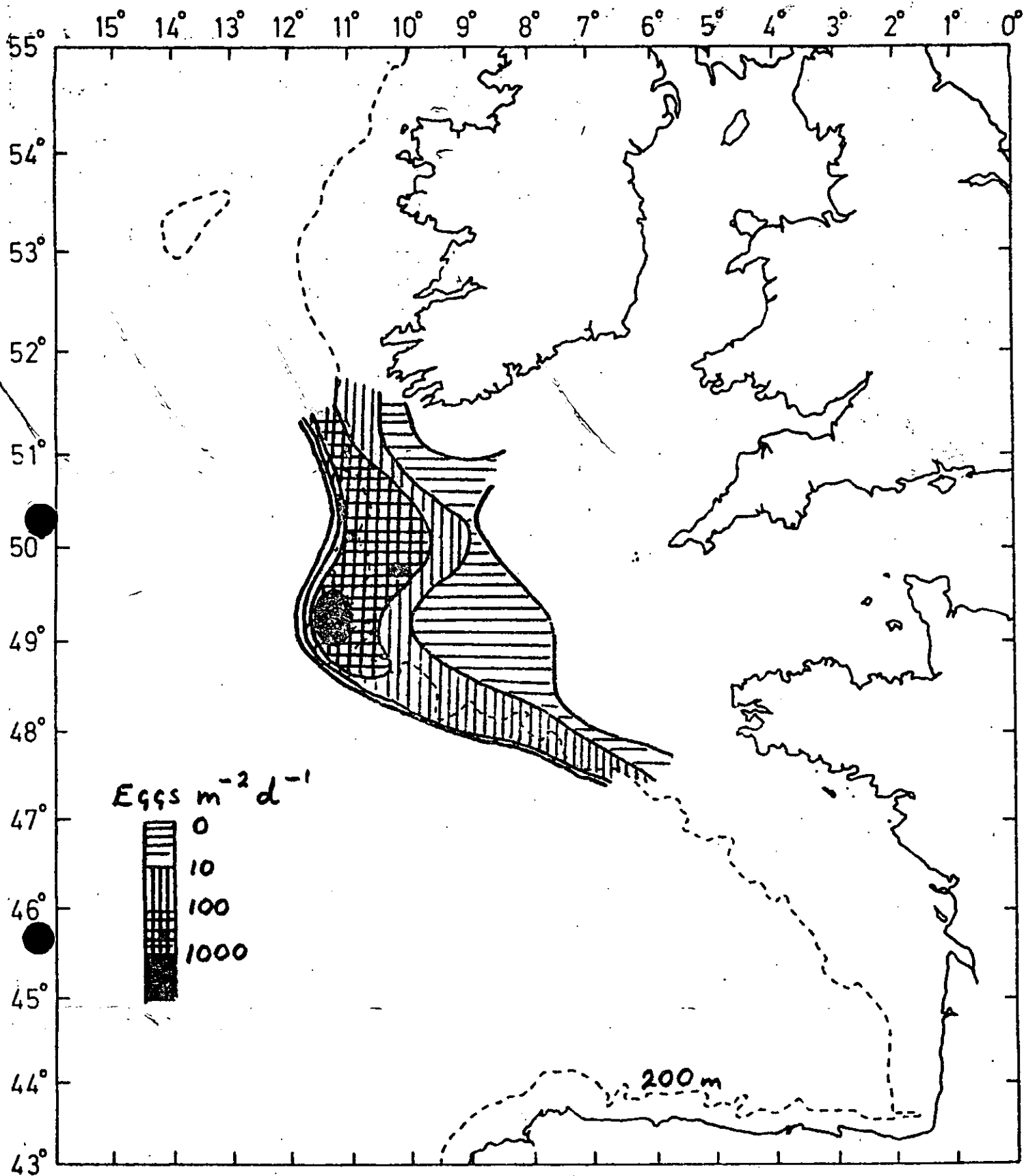


FIGURE 2
The distribution of Stage 1 mackerel eggs, May 1981.

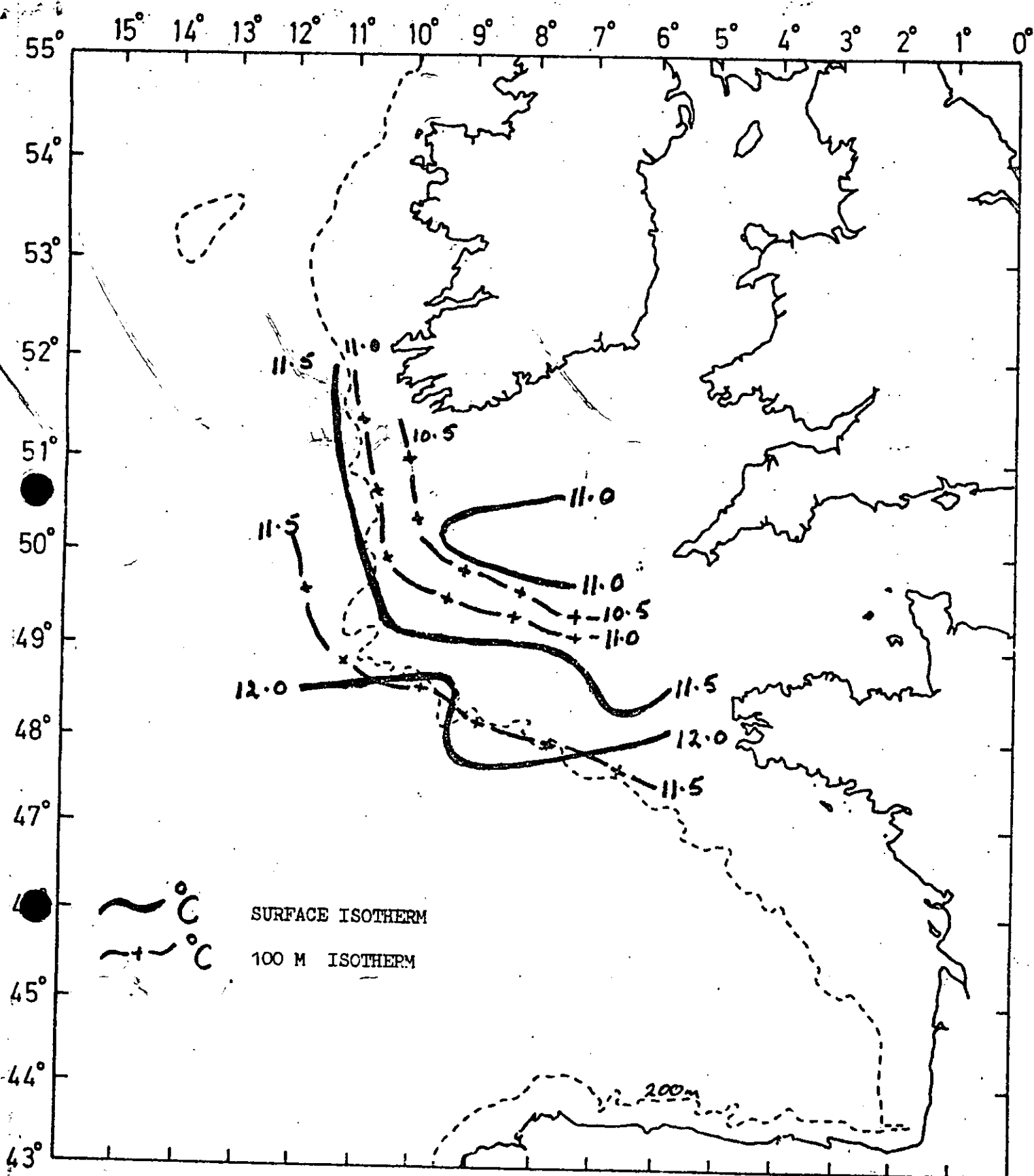


FIGURE 3
Surface and 100m isotherms, May 1981.